

WHAT IS CLAIMED IS:

1. A process for desulfurizing two hydrocarbonaceous feedstocks which process comprises the following steps:
 - (a) reacting a first hydrocarbonaceous feedstock comprising hydrocarbon components boiling above about 343°F (650°F) and hydrogen with a desulfurization catalyst in a desulfurization zone operated at desulfurization conditions to produce a desulfurization zone effluent;
 - (b) introducing the desulfurization zone effluent into a vapor-liquid separator operated at a temperature greater than about 288°C (550°F) to provide a vaporous stream comprising hydrogen, hydrogen sulfide and lower boiling hydrocarbonaceous compounds boiling up to about 371°C (700°F) and a first liquid hydrocarbonaceous stream comprising hydrocarbon components boiling above about 371°C (700°F) and having a reduced concentration of sulfur;
 - (c) passing the vaporous stream comprising hydrogen, hydrogen sulfide and lower boiling hydrocarbonaceous compounds boiling up to about 371°C (700°F) and a

second hydrocarbonaceous feedstock comprising hydrocarbon components boiling below about 371°C (700°F) to a hydrocracking zone to produce a hydrocracking zone effluent;

- 5 (d) passing the hydrocracking zone effluent and a hydrocarbonaceous recycle stream boiling in the range from about 149°C (300°F) to about 371°C (700°F) to a hydrogenation zone to produce a hydrogenation zone effluent;
- 10 (e) fractionating the hydrogenation zone effluent to produce an ultra low sulfur hydrocarbonaceous steam boiling in the range from about 149°C (300°F) to about 371°C (700°F); and
- (f) fractionating the liquid hydrocarbonaceous steam
- 15 recovered in step (b) to produce a hydrocarbonaceous recycle stream boiling in the range from about 149°C (300°F) to about 371°C (700°F) and a second liquid hydrocarbonaceous stream comprising hydrocarbon
- components boiling above about 371°C (700°F) and having
- 20 a reduced concentration of sulfur.

2. The process of claim 1 wherein the first feedstock is selected from the group consisting essentially of atmospheric gas oil, vacuum gas oil, coker distillates, cracked gas oils and admixtures thereof.
- 5 3. The process of claim 1 wherein the operating conditions for the desulfurization zone include a temperature from about 204°C (400°F) to about 482°C (900°F), a pressure from about 2.1 MPa (300 psig) to about 17.3 MPa (2500 psig) and a liquid hourly space velocity from about 0.1 hr⁻¹ to about 10 hr⁻¹.
- 10 4. The process of claim 1 wherein the operating conditions for the hydrogenation zone include a temperature from about 204°C (400°F) to about 482°C (900°F), a pressure from a bout 2.1 MPa (300 psig) to about 17.3 MPa (2500 psig) and a liquid hourly space velocity from about 0.1 hr⁻¹ to about 10 hr⁻¹.
- 15 5. The process of claim 1 wherein the ultra low sulfur hydrocarbonaceous stream produced in step (e) contains less than about 50 wppm sulfur.
6. The process of claim 1 wherein the ultra low sulfur hydrocarbonaceous stream produced in step (e) contains less
20 than about 10 wppm sulfur.

7. The process of claim 1 wherein the second feedstock is selected from the group consisting of light cycle oil, straight run middle distillate, kerosene and diesel boiling range hydrocarbons and coker distillate.
- 5 8. A process for desulfurizing two hydrocarbonaceous feedstocks which process comprises the following steps:
- (a) reacting a first hydrocarbonaceous feedstock selected from the group consisting essentially of atmospheric gas oil, vacuum gas oil, coker distillates, cracked gas oils and admixtures thereof, and hydrogen with a desulfurization catalyst in a desulfurization zone operated at desulfurization conditions to produce a desulfurization zone effluent;
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- (b) introducing the desulfurization zone effluent into a vapor-liquid separator operated at a temperature greater than about 288°C (550°F) to provide a vaporous stream comprising hydrogen, hydrogen sulfide and lower boiling hydrocarbonaceous compound boiling up to about 371°C (700°F) and a first liquid hydrocarbonaceous stream
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- 20 comprising hydrocarbon components boiling above about

371°C (700°F) and having a reduced concentration of sulfur;

5 (c) passing the vaporous stream comprising hydrogen, hydrogen sulfide and lower boiling hydrocarbonaceous compounds boiling up to about 371°C (700°F) and a second hydrocarbonaceous feedstock selected from the group consisting of light cycle oil, straight run middle distillate, kerosene and diesel boiling range hydrocarbons and coker distillate to a hydrocracking zone to produce a hydrocracking zone effluent;

10 (d) passing the hydrocracking zone effluent and a hydrocarbonaceous recycle stream boiling in the range from about 149°C (300°F) to about 371°C (700°F) to a hydrogenation zone to produce a hydrogenation zone effluent;

15 (e) fractionating the hydrogenation zone effluent to produce an ultra low sulfur hydrocarbonaceous stream boiling in the range from about 149°C (300°F) to about 371°C (700°F); and

20 (f) fractionating the liquid hydrocarbonaceous stream recovered in step (b) to produce a hydrocarbonaceous

recycle steam boiling in the range from about 149°C (300°F) to about 371°C (700°F) and a second liquid hydrocarbonaceous stream comprising hydrocarbon components boiling above about 371°C (700°F) and having a reduced concentration of sulfur.

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